by the time they had reached its top, we had mounted the third. In such a competition as this the increasing difficulty of respiration soon warns a man to stop, but in the life-long struggle for existence it is not so easy for one to know when he is getting out of breath and to relax his exertions in time. As a help to do this Dr. Richardson's work is most valuable, for he paints in vivid colours the symptoms of disease from worry and mental strain, beginning with the slighter ones of restlessness, irritability, and "an overweening desire to do more and yet more work," and ending with dementia, diabetes, &c. He gives a most salutary warning to those who strive to counteract the effects of mental overwork by adding to it hard bodily exercise, and his remarks on physical strain should be carefully perused by all young athletes. If his cautions were constantly attended to, we would have fewer instances of break-down either mental or physical. The effects of the passions on the body are next taken up, and then the action of alcohol and tobacco discussed at length.

Dr. Richardson seems to regard alcohol as an unmitigated evil, and although he acknowledges that sometimes tobacco may be useful in soothing the excited brain, he omits this beneficial action from the summary which he gives of the effects of smoking, and includes only the baneful effects which follow the abuse of the weed. This part of his book recalls to our mind a lecture in which the late Prof. Hughes Bennett denounced pastry as one of the chief causes of consumption. No one can doubt that pastry, alcohol, and tobacco are all capable of abuse, but whether their use is to be entirely prohibited on that account is an entirely different question.

The chapters on disease from the use of narcotics, and from late hours and broken sleep are especially interesting and instructive; and that on disease from food contains some most useful remarks on the injurious effects of too much tea, coffee, soda-water, seltzer, and sweets, as well as on the consequences of over-eating.

In treating of diseases from impurity of air the author mentions the bad effects of stoves, but he might also with advantage have drawn attention to the languor and inability to work which may be induced by burning much gas in the room where one is thinking or writing. He might have mentioned the Italian proverb, that when you have built a house you should make your enemy live in it for the first year, your friend for the second, and should inhabit it yourself in the third; but his observation of the occurrence of eight cases of consumption and fourteen of rheumatic fever in one row of pretty houses during the first two years after they were built may perhaps convince people of the danger of inhabiting damp dwellings, without any additional testimony.

Other chapters deal with diseases incident to some occupations, disease from sloth and idleness, from errors of dress, from imitation and moral contagion, automatic disease and hypochondriasis, and intermarriage of disease. The book concludes with a summary of practical applications or short directions how to avoid or counteract the sources of disease already discussed.

The work is of great value as a practical guide to enable the readers to detect and avoid various sources of disease, and it contains in addition several introductory chapters on natural life and natural death, the phenomena of disease, disease antecedent to birth, and on the effects of the seasons, of atmospheric temperature, of atmospheric pressure, of moisture, winds, and atmospheric chemical changes, which are of great general interest. In several points we do not agree with Dr. Richardson; we would like him sometimes to give fuller reasons for his dogmatic statements; we think he has perhaps pictured the effects of overwork in too glaring colours, and we think he has been somewhat unfair to alcohol and tobacco. But his book is most suggestive; it is written in a most attractive style, and it may assist the work and prolong the days of some who are unwittingly destroying their health, if they will only learn and attend to its warnings and counsels.

OUR BOOK SHELF

Over the Sea and Far Away, being a Narrative of Wanderings Round the World. By Thomas Woodbine Hinchliff, M.A., F.R.G.S., President of the Alpine Club. With Fourteen Illustrations. (London: Longmans and Co., 1876.)

Mr. HINCHLIFF, who is already known as the author of one or two pleasant narratives of travel, managed, in one year, to do 36,000 miles of ocean, besides spending a considerable time in exploring various regions of America and Asia. His reasons for writing this considerable book on his tour of the world are to induce other tourists to follow his example, not in writing a book, but in leaving the beaten paths and learning something about and enjoying the many beauties of South America especially, and also because he believes there is abundant room for a further and more detailed account of the natural aspect of many of the countries visited, "especially with regard to their scenery, their flowers, ferns, and fruits." We are bound to say that Mr. Hinchliff, from these points of view, has fairly justified the publication of the present work. He writes in excellent spirits, tells clearly what he saw, keeps up the interest from beginning to end, and the general reader, at all events, will find many things in the book quite new to him. Mr. Hinchliff spent most of his time in Western North America, in California, and the Yosemité Valley especially, in Brazil, Peru, and Japan. He is a good and enthusiastic botanist, a shrewd observer, and a clear narrator. He managed to see a great deal that was well worth seeing of the countries visited, their products, and their inhabitants, and although he opened up no new ground, he has been able to suggest aspects and describe phases that, we daresay, even those familiar with the literature of travel will recognise as original. The illustrations are good and appropriate, and altogether we can recommend the work as a really interesting and instructive record of a long tour.

Une Réforme Géométrique. Introduction à la Géométrie descriptive des Cristalloïdes. Par le C^{te} Léopold Hugo. (Paris, 1874.)

Géométrie Hugodomoïdale, anhellénique, mais Philosophique et Architectonique.

La Question de l'Équidomoïde et des Cristalloïdes Géométriques. Par le C^{te} Léopold Hugo. (Paris, 1875.)

ÉQUIDOMOÏDE : Sphère : : Prisme : Cylindre. "Équidomoïde, c'est en effet le nom que j'ai proposé pour la figure polygonale qui se place *avant* la sphère, comme le prisme et la pyramide se placent avant le cylindre et le cône en vraie philosophie. Il y a donc des équidomoïdes trigonaux, tétragonaux, pentagonaux, et ainsi de suite jusqu'à ce qu'on arrive à la sphère, leur sœur cadette . . . mon nouveau système, envisageant toutes les figures polygonales qui sont les aînées de famille de tes (the extract is taken from a hypothetical address to Archimedes), sphéroïdes et conoïdes, leur donne le nom générique de *domoides;* puis j'y fais adjonction, comme préfixe, des

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syllabes caractérisant les trois sections coniques ; d'où regulièrement ellidomoïde, paradomoïde et hyperdomoïde. D'autres figures, moins chargées, au contraire, que la pyramide, sont dites *trémoides*. Ce seront toujours, domoïdes et trémoïdes, des corps ou solides polygonaux, ou du moins considérés comme tels, et les rapports caractéristiques $\frac{2}{3}$, $\frac{1}{2}$, se constitueront le lien commun dans chacune des diverses familles. Ce sont choses que les curieux peuvent étudier dans mon ouvrage : *Théorie des Cristalloides*."

"Geometria renovata. Création d'une géométrie nouvelle, d'une morphologie architectonique. Geometria philosophica. Doctrine préexcellente ; de même que le polygone engendre le cercle, de même les cristallodomoïdes engendrent les sphéroïdes ; geometria Hugodomoidica sive Hugodomoidalis ! geometria asphéristica ! de même l'équidomoïde engendre la sphère !"

"Circulaire à messieurs les mathématiciens (on est très-poli dans cette géométrique-là) :—'L'équidomoïde préarchimédien a l'honneur d'informer votre seigneurie que par arrêté de S. E. le Commandeur Léopold Hugo, Président de la Géométrique Architectoni-primordiale, il a été nommé au poste occupé précédemment par la sphère, et qu'il s'y maintiendra envers et contre tous. L'équidomoïde espère que votre seigneurie voudra bien, ainsi que LL. AA. les Académies scientifiques, accueillir favorablement sa nomination et lui donner aide et appui contre les retours offensifs de la titulaire dépossédée. Il saisit cette occasion pour exprimer à votre seigneurie toutes les assurances de sa très-respectueuse consideration.

"'Equidopolis, le .'"

The motto is "Devise anti-archimédienne. L'equidomoïde va bien : le rebelle gagne du terrain ! . . . . suppression de la sphère !"

We have, in a recent number of NATURE, given a sketch of a work by the same author. Now we let him speak for himself. When we say that there are "Placards singuliers," "Placards plus ou moins singuliers destinés à MM. les Elèves de Mathématiques (Pamphlet fantasia)," "Objurgation Hugodomoidale," "Inauguration Transatlantique,

"Yankee doodle went to town
Upon th' equidomody,
Cocked a feather to his hat
And called it cristallody !"

&c., &c., in many languages, we have furnished our readers with some idea of the two works before us. *Spectatum admissi, risum teneatis?*

Count Hugo is the author of at least six pamphlets ; two more are in the press, and more in preparation, "and still they come."

Our latest acquisition is a sheet on "the Pan-imaginary theory (not the frying-pan)." "Here the space with $\frac{l}{m}$ dimensions gives birth, by its successive phases, to the *real space*, with *n* dimensions, and specially to the *natural space* with three dimensions, and to the sub-natural space with two dimensions, &c."

LETTERS TO THE EDITOR

The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

"The Recent Origin of Man"

THE letter of the author of the above work in NATURE, vol. xiii. p. 484, presents two points which demand an answer. 1. The reviewer is asked for his authority for the statement that palæolithic implements have been met with in Asia Minor. It is to be found in Evans' "Ancient Stone Implements," p. 571, and in Dawkins' "Cave-Hunting," p. 429. The discovery was made by the Abbé Richard between Mount Tabor and the Sea of Tiberias. 2. My opinion, which is also shared by some of the leading archæologists of Britain, that the interments at Solutré have not been proved to be palæolithic, has unfortunately evoked a charge of "ignorance and treacherous memory" from the author. I would merely remark that I am not ignorant of the account of Solutré in the "Matériaux," and in the "Archives du Muséum de Lyon," the latter of which is apparently unknown to the author, nor has my memory failed me concerning the debate on Solutré at the French Association, and the human skulls and implements which I then saw. Mr. Southall's argument as to the modern date of some of the reindeer, based on the percentage of gelatine in their bones, may be left to the tender mercies of Mr. Evans, and the comparison of the finely-chipped implements, with the Danish Neolithic finds, to those of M. de Mortillet, who takes them to be typical of one of the stages of the palæolithic period.

The discussion of the other questions raised in the letter, such as the Neolithic age of the *Rhinoceros hemitœchus* of the Gibraltar caves, or the reiterated assertion that the Irish Elk lived in Europe in the middle ages, is unnecessary in the present state of scientific inquiry. How an appeal to the mound at Hissarlik, to the discoveries at Alise, to the pile dwellings, to the food in the stomachs of fossil elephants and Mastodons, or to the recent elevation of Uddevalla can prove the "recent origin of man," may safely be reserved for decision to the judgment of the reader, without any comment from THE REVIEWER

On the Formation of Coral Sand

IN the best books on geology one finds that the formation of coral sand is attributed to trituration by the force of the surf, the waste of shells and minute globigerinæ, and even to the droppings of those fishes which are said to browse upon the living coral.

While residing at Santa Cruz in the West Indies about this time last year, my friend Mr. Quin, inspector of schools there, first pointed out to me the great importance of a certain sea-weed in the formation of coral sand, and I had ample opportunity for verifying his observation while I stayed there.

A Coralline limestone is formed of coral blocks, consolidated coral-sand, and mud, shells, and myriad calcareous cases of minute organisms. Of these, next perhaps to the coral itself (of which I have seen great masses whose features were not quite effaced by percolation, &c., in the upheaved limestone of Santa Cruz), the bulkiest ingredient is the coral sand and mud, especially the sand, the shells and cases being of minor importance.

We are invariably taught, as far as I have seen, that coral sand is mainly formed of the trituration of the coral skeletons among each other, but it is difficult to see how this can be when one has seen both the sand and the skeletons, and the action of the surf which is mostly among the coral yet alive and cushioned with a vegetable matter. The coral skeleton is extremely hard and crystalline, and when two pieces of dead coral are rasped together by the action of the wave breaking over the reef they will triturate themselves into very fine grains. One can understand how the coral mud can be formed in this manner ; but not so easily how the coral sand is formed. A glance at coral sand as it is seen forming the curving beaches in the pretty coves of the West Indian Islands shows that it is formed of *coarse* calcareous grains smoothed and rounded by the water, and of rather a soft friable nature, more like water-washed fragments of stucco or shell than crisp coral. On examining it more closely one sees that it is mainly composed of fragments and scales of soft calcareous matter of a mellow whiteness, and easily broken between the fingers. The larger of these scales have a peculiar shape, roughly like a half moon, whilst others are plainly only broken pieces of the larger.

Nor is the source of these far to seek. One finds everywhere strewed over the surface of the sand white bunches of a dead sea-weed, or rather of its calcareous skeleton, bleaching in the sunshine, every perfect leaf of which is one of these half-moon shaped scales, and all connected together by flax-like fibres. They have been cast ashore by high tides from the fringing reef. (See fig.)

In the reef itself, whilst sailing over it, one sees among the dark coral masses white sheets of coral sand, and when these are scrutinised more closely they prove to be almost entirely formed of these broken scales or leaf-skeletons.

One day I went with Mr. Quin to the outer edge of the reef at low water, and landed on its shoaling crest. Mr. Quin was provided with a very useful lens, wherewith to view the

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